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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,290	02/05/2004	Chandra Mouli	M4065.0556/P556-A	3228
24998	7590	06/30/2005	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			GUERRERO, MARIA F	
2101 L Street, NW			ART UNIT	
Washington, DC 20037			PAPER NUMBER	

2822

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/771,290

Applicant(s)

MOULI ET AL.

Examiner

Maria Guerrero

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 98-126 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 98-126 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This Office Action is in response to the preliminary amendments filed February 5, 2004 and August 30, 2004.

Status of Claims

2. Claims 1-97 are canceled. Claims 98-126 are pending.

Information Disclosure Statement

3. The information disclosure statements filed February 5, 2004, August 30, 2004 and June 8, 2004 have been considered.

Specification

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 98 is rejected under 35 U.S.C. 102(e) as being anticipated by Han et al. (US 6,521,924).

Han et al. shows a method of forming an image sensor comprising the steps of: forming a pixel within a substrate, forming an isolation region adjacent the pixel, and forming an isolation gate over the isolation region and over at least a portion of a connection region formed adjacent to the isolation region (Abstract, Fig. 3, 4E-5; 6E, col. 1, lines 15-25, col. 2, lines 30-40, col. 3, lines 30-65, col. 4, lines 50-65).

6. Claims 98-101 and 107-123 are rejected under 35 U.S.C. 102(e) as being anticipated by Nozaki et al. (US 6,570,222) (cited on IDS).

Nozaki et al. discloses forming a CMOS image sensor comprising forming a pixel within a substrate and forming an isolation region adjacent the pixel (Fig. 7, col. 8, lines 3-25, col. 13, lines 24-30). Nozaki et al. discloses forming an isolation region around at least a portion of the pixel and forming an isolation gate (13b) over at least a portion of the isolation region (STI) (Fig. 7, col. 8, lines 3-25).

Nozaki et al. also describes the pixel further comprises at least one transistor gate (24b) for transferring photoelectric charges from said photosensitive region (34a, 34b) and wherein said isolation gate is of the same conductivity type one transistor gate; wherein said photosensitive region, comprises a p-type conductivity substrate (11), an n-type conductivity photodiode region (15); and a p-type conductivity surface region (21) (column 1, line 35 to column 3, line 35).

Furthermore, Nozaki discloses an active layer of a first conductivity type formed within a substrate (Figure 1); one transistor gate (13a) formed over a portion of said active layer (Fig. 7); a photosensor (34a) formed adjacent said transistor gate; an isolation region (STI) formed in said active layer adjacent to said photosensor; and an

isolation gate (13b) formed over at least a portion of said isolation region (Fig. 7); wherein said photosensor comprises a p-n-p junction region formed under said one transistor gate (Fig. 23); said p-n-p junction region comprising a surface layer (21) of a first conductivity type overlying a photosensitive region of a second conductivity type (15); said photosensitive region overlying said active layer of said first conductivity type (col. 14, lines 1-65).

In addition, Nozaki et al. teaches forming an output transistor for reading out charge from the floating diffusion region, forming a read out circuit comprising at least the output transistor, and forming a photodiode (col. 14, lines 1-52). Nozaki discloses a pixel (Fig. 7) for receiving incident photo energy and converting it into an electrical signal; said pixel comprising: a photosensitive area (34a) for accumulating photo-generated charge; a floating diffusion region adjacent a side of said photosensitive region (figure 23) for receiving charge from said photosensitive area; a read out circuit comprising at least an output transistor (13a) for reading out charge from said floating diffusion region; an isolation region (STI) formed around a portion of said pixel; and an isolation gate (13b) formed over at least a portion of said isolation region (col. 2, lines 7-65, col. 3, lines 1-65, col. 4, lines 1-65, col. 8, lines 3-65). Nozaki et al. teaches minimizing leakage, noise, and dark current (col. 8, lines 53-65, col. 11, lines 1-18).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 102-106 and 124-126 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nozaki et al. (US 6,570,222) in view of Casper (US 5,835,433).

Nozaki does not specifically show applying a voltage to the isolation gate, biasing the isolation gate to a constant voltage and reverse biasing said isolation region by applying said constant voltage. However, Nozaki describes it is expected that a CMOS image sensor operating at a power supply of 3.3 V or lower will be developed according to the above description in order to decrease the size and power consumption of the solid state image device further (col. 2, lines 43-65, col. 3, lines 27-

65). In addition, Casper is cited as evidence to show that biasing the isolation gate to a constant voltage and reverse biasing said isolation region by applying said constant voltage is part of the well known process of operating a sensing device (Abstract, col. 1, lines 45-67, col. 2, lines 30-67, col. 3, lines 25-67).

Therefore, it would have been obvious to a person of ordinary skill in the art would recognize that during operation the CMOS image sensor disclosed by Nozaki; the step of biasing the isolation gate would be included as suggested by Casper in order to operate the sensor as desired without providing timing inaccuracies and improving the performance of the elements (Casper, col. 1, lines 35-50; Nozaki, col. 3, lines 50-55).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 571-272-1837.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

June 24, 2005

Maria Guerrero
MARIA F. GUERRERO
PRIMARY EXAMINER